

What is claimed is:

1. A magnetic resonance imaging system comprising:
static magnetic field generating means for generating a static
magnetic field containing a uniform region whose magnetic intensity is
5 uniform;

a couch movable in a predetermined direction passing through
the static magnetic field, an object to be imaged being laid on the couch;

a reception multiple RF coil including a plurality of coil members
disposed toward the object;

10 position changing means for automatically changing a relative
position formed between the couch and the magnet in the predetermined
direction in accordance with a length of each of the plurality of coil
members detected in the predetermined direction;

15 scanning means for scanning the object by applying a given train
of pulses to the object at each position changed by the position changing
means;

reception means for receiving through the multiple RF coils an
echo signal that emanates responsively to the application of the train of
pulses by the scanning means;

20 reception-processing means for processing, with given processing
for reception, the echo signal received by the reception means so that the
echo signal is converted into echo data; and

image producing means for producing an MR image based on the
echo data converted by the reception-processing means.

25 2. The magnetic resonance imaging system of claim 1, wherein
the predetermined direction is a longitudinal direction of the couch and
the position changing means is composed by means for moving a position
of the couch in the longitudinal direction with the static magnetic field
30 generating means fixed.

35 3. The magnetic resonance imaging system of claim 2, wherein
the position changing means is composed by means for changing the
position so that a center position of each of the plurality of coil members
in the longitudinal direction agrees with the uniform region of the static
magnetic field.

FOOTNOTES

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4. The magnetic resonance imaging system of claim 3, wherein the reception processing means includes selection means for automatically selecting, from the echo signals received individually by the plurality of coil elements, the echo signal received by a certain coil member located at the center of the uniform region in the longitudinal direction, the selected echo signal being given to the image producing means.

5. The magnetic resonance imaging system of claim 4, wherein the selection means includes signal level detecting means for detecting a level of the echo signal received by each of the plurality of coil members, and signal selecting means for automatically selecting the echo signal received by the coil member located at the center of the uniform region in the longitudinal direction on the basis of changes in the level of the echo signal detected by the signal level detecting means.

6. The magnetic resonance imaging system of claim 3, further comprising ID generating means for generating an ID number inherent to each coil member, the ID producing means being disposed with each of the plurality of coil members, size memorizing means for memorizing a size of each of the plurality of coil members in the longitudinal direction, the size corresponding to the ID number of each coil member generated by the ID generating means, disposal detecting means for identifying each signal line of the plurality of coil members so as to detect a disposal state of the plurality of coil members in the longitudinal direction, and determination means for determining the size by making detection information about the coil disposal state detected by the disposal detecting means refer to the size memorizing means,

the position changing means includes means for moving the position of the couch based on the size determined by the determination means, and

the reception-processing means includes selection means for automatically selecting, from the echo signal received by each of the plurality of coil members, a certain echo signal received by the coil member located at the center of the uniform region in the longitudinal

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7. The magnetic resonance imaging system of claim 2, wherein the pulse sequence is set to include the number of encoding steps less than a given number of encoding steps required for reconstructing the MR image by one,

the image producing means is composed of means for performing unfolding processing on a set of the echo data obtained by the reception processing means at every position of the couch changed by the position changing means on the basis of different sensitivity distributions of the plurality of coil members.

9. The magnetic resonance imaging system of claim 1, wherein each of the plurality of coil members constituting the multiple RF coils is a whole-body coil.

11. A magnetic resonance imaging system comprising:
static magnetic field generating means for generating a static magnetic field containing a uniform region whose magnetic intensity is

uniform;

a couch movable in a predetermined direction passing through the static magnetic field, an object to be imaged being laid on the couch;

at least a single reception RF coil disposed fixedly to the static magnetic field generating means;

position changing means for automatically changing a relative position formed between the couch and the magnet in the predetermined direction;

scanning means for scanning the object by applying a given train of pulses to the object at each position changed by the position changing means;

reception means for receiving through the reception RF coil an echo signal that emanates responsively to the application of the train of pulses by the scanning means;

reception-processing means for processing, with given processing for reception, the echo signal received by the reception means so that the echo signal is converted into echo data; and

image producing means for producing an MR image based on the echo data converted by the reception-processing means.

12. The magnetic resonance imaging system of claim 11, wherein the reception RF coil is one in number.

13. The magnetic resonance imaging system of claim 12, wherein the reception RF coil is a whole-body coil used in common for transmission and reception.

14. The magnetic resonance imaging system of claim 13, wherein the train of pulses is set to include the number of encoding steps less than a given number of encoding steps required to reconstruct the MR image by one, and

the image producing means is composed of means for performing unfolding processing on a set of the echo data obtained by the reception processing means at every position of the couch changed by the position changing means on the basis of different sensitivity distributions of the plurality of coil members.

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~~and the image data obtained through the first imaging scan~~

18. The magnetic resonance imaging system of claim 16, wherein the reception RF coil is one in number.

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19. An MR imaging method of obtaining an image of an object based on a sub-encoding technique (fast imaging technique) using a reception RF coil, the object being laid on a couch, the method comprising the steps of:

10 acquiring by acquiring means data of coil sensitivity distributions of the reception RF coil and image data at a plurality of positional relationships between a region to be imaged of the object and the reception RF coil; and

15 unfolding by data processing means the image data acquired at each position of the object using the data of the coil sensitivity distributions.

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FOOTNOTES

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